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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,341	10/29/2001	Gerd Tomazic		5931

7590 03/12/2004  
Testa, Hurwitz and Thibeault, LLP  
125 High Street  
Boston, MA 02210-2704

EXAMINER
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YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/053,341

**Applicant(s)**

TOMAZIC, GERD

**Examiner**

Dah-Wei D. Yuan

**Art Unit**

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-14, 17-20 and 25-27 is/are rejected.
- 7) ☒ Claim(s) 7-9, 15, 16 and 21-24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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**RECOMBINATOR FOR THE RE-ACIDIFICATION OF AN ELECTROLYTE STREAM  
IN A FLOWING ELECTROLYTE ZINC-BROMINE BATTERY**

Examiner: Yuan

S.N. 10/053,341

Art Unit: 1745

March 4, 2004

***Claim Objections***

1. Claims 22,25,26 are objected to because of the following informalities:

These claims should depend on independent claim 19 instead of 18.

Appropriate corrections are required.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3,10,14,17-20,25 are rejected under 35 U.S.C. 102(b) as being anticipated by Putt (US 4,343,868).

Putt teaches a zinc-bromine electrochemical system comprising a zinc-bromine battery (12), two reservoirs (30,32), and an electrolysis cell (14) (recombinator). The positive electrolyte in the zinc-bromine battery is an aqueous solution having a specific bromine concentration and the negative electrolyte is an aqueous solution containing a substantially lesser concentration of bromine. As the electrochemical reaction takes places, some hydrogen ions are lost from the negative electrolyte solution in the form of hydrogen gas which evolves at the

negative electrode. The evolved hydrogen along with bromine electrolyte can reach the recombinator via a first bypass tube (62). The resulting hydrobromic acid in the recombinator is then transported back to the reservoir via a second bypass tube (64). The electrolysis cell has a housing (42), a positive internal chamber section (44) and a negative internal chamber section (46). These two chamber sections are separated by a cation-exchange membrane (48) which is designed to pass ions, specifically hydrogen ions, but not liquids or oxygen gas. Pumps (58,68) are coupled to the network to regulate and control the flow of reactants in the system. The two reservoirs, which are in fluid communication with the battery, are used to store the electrolyte solution. In addition, a method to operate the zinc-bromine electrolysis cell is also taught. See Figure 1, Column 2, Lines 34 to Column 3, Line 24; Column 4, Lines 2-18.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-6,11-13,26,27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Putt (US 4,343,868) as applied to claims 1-3,10,14,17-20,25 above, and further in view of Grimes (US 4,540,639) as evidenced by Firatli et al. (US 5,394,862).

Putt disclose a zinc-bromine electrochemical system as described above in Paragraph 3. However, Putt does not teach the use of a platinized carbon cloth as the catalyst. Grimes teaches a method for recombining gaseous decomposition hydrogen with bromine in a zinc-bromine battery system. The gaseous decomposition hydrogen is reacted with bromine in the presence of a catalyst, such as ruthenium and platinum, which encourages the formation of hydrogen and bromide ions. See Column 1, Line 63 to Column 2, Line 4. It is well known in the art that ruthenium, platinum and platinized carbon cloth are functionally equivalent catalysts. Therefore, it would have been obvious to one of ordinary skill in the art to add platinized carbon cloth in the recombinator device of Putt, because Grimes teach the use of catalyst can encourage the formation of hydrogen and bromide ions in a zinc bromine battery system. The catalyst can have various shapes and forms, including wire mesh and annular spiral as disclosed in Firatli et al. See Column 4, Lines 14-26. Therefore, it would have been obvious to one of ordinary skill in the art to use catalyst in the form of an arrayed spiral or a mesh material on the recombinator device of Putt and Grimes, because Firatli et al. teach they are all functionally equivalent catalysts.

***Allowable Subject Matter***

6. Claims 7-9,15,16,21-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 7-8 would be allowable because the closest prior arts of record, Putt and Grimes, do not disclose or suggest the reaction facilitating means

comprises means for controlling temperature within the reaction chamber. Claim 9 would be allowable because the closest prior arts of record, Putt and Grimes, do not disclose or suggest the use of means for controlling the temperature within the reaction chamber. Claims 15-16 would be allowable because the closest prior arts of record, Putt and Grimes, do not disclose or suggest the control means comprises a capillary operatively associated with the bromine receiving means. Claim 21 would be allowable because the prior art does not disclose or suggest the flow of hydrogen and bromine streams at one to two drops per minute. Claim 22-24 would be allowable because the closest prior arts of record, Putt and Grimes, do not disclose or suggest the step of regulating the temperature of the housing and the temperature within the reaction chamber.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan  
March 4, 2004

A handwritten signature in cursive script, appearing to read "Dah-Wei D. Yuan", followed by a long horizontal flourish.